IOP Conference Series: Materials Science and Engineering

PAPER • **OPEN ACCESS**

Terminological modelling of the aviation terms system in the context of globalized information space and security of aviation industry

To cite this article: Iryna Burlakova *et al* 2020 *IOP Conf. Ser.: Mater. Sci. Eng.* **918** 012085

IOP Conf. Series: Materials Science and Engineering **918** (2020) 012085 doi:10.1088/1757-899X/918/1/012085

Terminological modelling of the aviation terms system in the context of globalized information space and security of aviation industry

Iryna Burlakova[1], Anastasiia Sibruk[1], Liudmyla Khalinovska[1], Viktor Sibruk[1]

[1]National Aviation University, Komarova Avenue 1, 03058, Kyiv, Ukraine

E-mail: ira.gmi.nau@ukr.net

Abstract. Ukrainian aviation terminology, which denotes the concept of this field of technology, belongs to the general technical terminology of the Ukrainian language. Solving a number of problems of translation and adaptation of borrowed terms, primarily from English, will lead to the active integration of national terminology to the scientific world. One of the important issues in the development of Ukrainian aviation terminology at the regional and global levels is the quality and adequate translation of domestic terms into the global aviation language called *airspeak* which is part of the global language - lingua franca (ELF). One of the main tasks of linguistic science is the systematization and generalization of phenomena and the formalization of the laws of their origin and functioning. Terminology has its own specificity, which consists in the fact that a large number of special words is borrowed from other languages by the professional broadcasting, which is connected with scientific and technological progress, cooperation of scientists from different countries of the world. The vocabulary of terminological systems is the most actively replenished and changed. One of the main features of terminological vocabulary replenishment is the use of foreign words and their components for naming new concepts. Classical terms meet the requirements of accuracy, brevity and ensure the uniqueness of the term.

1. Introduction

The modern aviation industry belongs to the complex systems of equipment and technology (production), which continues to actively develop. Ukrainian aviation terminology is a system of special names for a wide range of scientific disciplines (aerostatics, aerodynamics, mechanics, engineering, etc.), closely related to the rapid scientific and technical progress. Aviation terminology of the Ukrainian language is a local segment of world aviation terminology. Today, Ukraine is among the nine countries with a completed technological cycle of aircraft design and production from the first designs to launch into serial production under its own brands and ranks seventh in terms of production potential.

2. Aim and tasks

The aim of the article: define the basic requirements for the aviation term as a unit of terminological system. Main research tasks: to analyze the existence of synonymy and insufficient accuracy of aviation terms, to describe the process of integration of national terminology.

3. Research methods

The following methods have been used to solve certain tasks in research: descriptive, comparative-historical and comparable with the elements of external and internal reconstruction, structural with the use of the method of component analysis, elements of statistical analysis.

4. Research results

There is a large amount of linguistic research devoted to terminology vocabulary in the development of modern linguistics. General theoretical problems of terminology were considered by G. Vinokur, O. Wuster, A. Gerd, B. Golovin, V. Danilenko, T. Kandelaki, G. Rondo and others. The problem of translating terms from English into Ukrainian was and remains one of the most relevant in modern translation studies. Studies of the transfer of terms in the translation process were conducted by scientists F. Zitkina, T. Kyyakom, Y. Zatsnym, A. Yegorova, S. Komarova and others. One of the areas of modern research in the field of linguistics is to consider the main features and patterns of functioning of different types of terms in the scientific field. At any stage of scientific development, there is the knowledge that can be organized into a relatively complete system that is not static and can evolve over time. Further research makes some changes (additions) to this system or even destroys it, but systematization based on the establishment of logical links between individual facts and phenomena remains fundamental in creating a scientific vision of the world.

Scientific and technical terminology is a broad vocabulary where terminology develops intensively and interacts actively with each other. Therefore, the study of the laws of the formation of terminological vocabulary, its structure and semantics has become one of the most important tasks of modern terminology studies of linguistics [4].

Peculiarities of the Ukrainian language in aviation, according to O. Kovtun, are completely solvable because, "the presence of lexical, terminological and lexicographic base indicates the possibility of widespread introduction in the field of the state language, which should become a means of professional speech activities of aviation professionals" [12]. V. Yahupov noted that linguistic competence is knowledge of the phonetic, lexical, grammatical and orthographic system of a foreign language, combinatorial and variable possibilities of using lexical units, a set of knowledge, skills and abilities that provide mastery of language tools, determining the communicative content of understanding individual language units, their meanings, forms and structures, connections between them, language knowledge and possession of certain rules of transformation of this knowledge in the process of interpersonal communication [24].

One of the requirements for Ukraine's implementation in global aviation is to minimize aviation incidents because almost 80 percent of the causes are human factors, which consist of imperfect communication and misreading of aviation terminology in Ukrainian or English languages.

An important factor in maintaining air safety is normalized and harmonized to certain requirements terminology. It is well known that terms fully realize their potential by being within terminological systems. Systematicity is not the only requirement for the term. Researchers are mixed in the number of requirements. Among the main requirements are often called such as systematic; the accuracy of definition; the tendency to unambiguity within its terminological field; optimal term length; stylistic neutrality; the accuracy of semantics; high informativeness. First of all, the terms should be evaluated from the standpoint of strict affiliation to the system, logical and verbal validity, and depending on the place in the system of a particular scientific or industrial activity. Thus, systematicity is considered not only a basic feature of terminology but also one of the most important conditions for the existence of a terminological system. This is the main requirement for the term. Today, the main task of terminologists is to work on improving the level of the systematics of terminology both at the internal and intersectoral levels, although it is generally impossible to achieve absolute systematics.

In aviation, the types of cultural interaction are diverse. Pilots who perform international flights, whose crews consist of representatives of different cultures, dispatchers, engineers with aircraft maintenance and ground personnel are in constant contact with representatives of different cultural

backgrounds, they should all be well aware of cultural differences and show increased vigilance in this regard. Aviation industry - the most obvious example of shifting the boundaries of cultures and countries, nationalities and ethnic groups. Namely, they are forced to be in constant contact with representatives of various nationalities and religions [15].

Aviation discourse is the speech of aviation specialists, the purpose of which is the verbal exchange of professional information under flight time by radiotelephony by means of English [13]. Therefore, it is very important to accurately translate a certain term.

5. Discussion

One of the main requirements for the term, most scholars call its neutral color, associative neutrality, and lack of connotations. L.V. Turovska notes that terms of foreign origin, borrowed or formed on the basis of Greek and Latin roots, exclude or minimize the possibility of associating terms with words of neutral vocabulary [21]. However, it is not always possible to maintain the expressive neutrality of a term in terminology, as it, as a linguistic unit, is often characterized by the presence of metaphor and metonymy. For example, in aviation terminology, there are the terms tail, wing; crew (a certain number of people) and crew (aircraft and crew); common creation of terms with the help of diminutive suffixes (belly (airfoil) – *cherevtse* (*lopati);* screw head – *holovka hvynta*, steering wheel boar – *holovka hvynta*), etc. Thus, as noted by L.V. Turovska, “monosemanticity, emotionlessness of the term are only its desired features. In special use, they are supported by the desire for regularity, standardization of terms, and in the common language, flow is destroyed by the desire for emotion, expressiveness, open motivation of the word” [21].

“In connection with the active development of modern Ukrainian terminology, there is an urgent need special study of linguistic phenomena associated with the development of this terminology. It is especially important to analyze new terms or new meanings of existing terms, which arose as a result of semantic rethinking of existing ones nominations” [5]. Among the many industry scientific and technical systems, there are terms for which accuracy is only one of the requirements that is difficult to apply in practice. Among the many industry scientific and technical systems, there are terms for which accuracy is only one of the requirements that is difficult to apply in practice. In particular, E.F. Skorokhodko says that there are “objects, phenomena, processes that are inaccurate in nature, that are interpreted as blurred, or that have blurred boundaries”. This can be illustrated by the concept of speed in aerodynamics (subsonic, supersonic (hypersonic)), the limits of which depend on the number M (Mach), when the transition from one speed to another can’t be a clear time frame and is not a constant value that could be measured [19].

Recent linguistic studies have partially denied the absolutization of the requirements for the "ideal" term. After all, each such lexeme is not isolated within the branch terminological systems but is a part of the domestic language, where dynamic evolutionary laws operate. This opinion is shared by Ya. Zhytin, who says that the main purpose of the term is to serve the direction of professional communication (science, production, and management), but falling into a non-special context, it loses its characteristic features, <…> changes its function [24]. Supporting such assumptions, we consider requirements to the term only desirable tendencies that are not realized in scientific and technical terminology in full.

Borrowed lexemes, often internationalisms formed on the basis of Greek and Latin root components, usually better meet the above requirements for the term, but their excessive number in the domestic language leads to leveling and a kind of "blurring" of the autochthonous term system. This phenomenon negatively affects the dynamics of the development of Ukrainian scientific and technical terminology. The solution to this problem could be an effort to maintain the balance of domestic and borrowed terms, although today there are extreme purist requirements for the development of terminology. Reasonable balance and control of borrowings by means of purist methods, according to P. Selihei "is called in times of globalization to protect the identity of the already developed literary language as a counteraction to British-American pressure" [16]. Among the figurative means of scientific style there are those that are created without participation analogies. In

the process of cognition, scientists gave names objects and phenomena of reality, not comparing them with other objects. Such names are characterized by conventionality, unmotivated, occasional [17].

Aviation terminology of the Ukrainian language contains a significant part of borrowed lexemes, but throughout the history of its formation, there is a sufficient number of native lexemes. Some terms are synonymous, although synonymy is generally undesirable for terminology. Synonymy in terminology, as noted by L. Zadoiana, has some differences from synonymy in the common vocabulary. These are the lack of expressiveness, stylistic differentiation within the scientific style, differentiation by areas of use, etc. [25].

The interchangeability of lexemes was defined by L.A. Bulakhovskyi as one of the features of synonyms, the scientist noted that words that can be replaced in a certain context or contexts close in meaning, without a noticeable difference in meaning, are called synonyms [3]. Such interchangeability is possible only between doublets and is completely impossible between synonyms-equivalents, which differ incompatibility. Often the distinction between synonyms is by denotation (different concepts of identical objects) and signification (one concept of different objects). For example, the terms: *shyriaty* (levitate), *planeruvaty* (glide), *zavysaty* (hang in), (refers to a helicopter) are synonymous (based on the generalized concept of "fly"). If the first two terms are removed from the above synonymous line, the movement (actually flight) in the airspace will apply to another type of aircraft, namely a helicopter. In particular, L.O. Symonenko notes that “the significant grouping of terms into synonymous lines is associated with the invention of a new object of study, which at the very beginning due to the vagueness of its nature and little knowledge about it always lead to more or fewer terms lines” [20]. For example, the modern term aviation in the dictionaries of the initial period of formation of the aviation terminology system (see dictionaries of the 1920s) shows synonyms of *aeronautics* and ***aerostatics***. In modern sources, these terms exist in isolation, because at the present stage of development of aviation terminology began to denote different concepts.

The formation of scientific concepts leads to the borrowing of new terms that give rise to synonymy. Let's note that direct borrowing is inherent in any terminology system at certain stages of its formation when there are several words to denote the same definition, for example, to denote "aircraft heavier than air intended for flights in the atmosphere", were used the following terms: *aeroplanъ (аэропланъ) (fr. aeroplane) – samolit, aeroplian (самолiт, аэроплян)* (*rus. samolet (самолет)*) – modern *litak (лiтак)* [8]; *samoletъ – samolit; (паротъ) poron (самолетъ – самолiт; (паромъ) порон)* [8].

According to L. M. Vasyliev, the application of the binary criterion for determining synonyms is important for understanding synonyms as absolutely identical in the meaning of units (omosemants); understanding as identical or very close in meaning to language units (parasemants). In particular, he notes that synonyms are interpreted as units of language, identical in meaning, but different in significance: stylistic, usual (syntagmatic), temporal, genetic, etc [22]. An example of temporal significance in aviation terminology is the above-described synonymous pair aeroplane - airplane. In this case, we can talk about narrowing the meaning of the first lexeme: about 40's of the twentieth century. The term referred to all available heavier-than-air aircraft, later, with the development of the industry and the emergence of more advanced aircraft, the term gradually moved to the category of lexeme-historicisms.

The search for a suitable name is conditioned by the creation on a domestic basis of a lexeme equivalent to borrowing. The borrowed term is widely influenced in the language, comes into contact with other words on the lexical, semantic, word-forming levels. As a result of such contacts, an unambiguous word is formed, formed by morphological or semantic tracing; thus, synonymous pairs arise, one of the members of which is specific and the other is borrowed. Such pairs exist as doublets for some time, until one of the terms becomes part of the passive vocabulary, and the other remains in the active part of the lexical fund of the Ukrainian language. For example, the terms *bortinzhener* (flight engineer) and *bortmekhanik* (onboard mechanic) have a common semantic ‘technician’, but the meaning of the second term is narrower, it gradually becomes part of the passive vocabulary.

An example of the denial of the thesis about the undesirability of synonymy in terminology is the existence in the aviation terminology of the Ukrainian language of the terms *vertolit, helikopter* and *hvyntokryl*. The translation of the named lexemes into English is problematic because they have synonymous relations, among the trio of these terms there is both absolute and relative synonymy.

In Ukrainian, the lexeme *helikopter* (helicopter) was borrowed from French in the late nineteenth century. In Ukrainian lexicography, the analyzed lexemes record several dictionaries. In particular, the term *helikopter* (helicopter) is attested in the "Dictionary of foreign words" ("Slovnyk chuzhomovnykh sliv"), authors: I. Boikiv, O. Iziumov, T. Kalyshevskyi, M. Trokhymenko (1996): helicopter, gr. - "a heavier-than-air aircraft capable of being lifted almost vertically by means of a suitable horizontal propeller, scaled with wings rotating about a vertical axis. The plane has a gradual movement from an ordinary vertical propeller" [6].

Probably the term *vertolit* was coined by the French gyroplane (with the same meaning that has existed since 1907). That is, the part *vert-* (from the word verti) corresponds to the French gyro-, which comes from the Greek γύρος - circle, γυρεύω - rotate - in complex words corresponds to the concept of "rotational motion" [6].

An example of the thesis about the difficulties of translating borrowed terms into Ukrainian and attempts to create them on a Ukrainian basis is published in the diaspora in 1977. "Slovnyk chuzhosliv. Znadibky" P. Shtepa where the author, in particular, considers synonyms of the lexemes *avtozhyr – helikopter* [18], *vertolit – helikopter* [18]. The author proposes to replace these terms with the artificially created name *krutniak* [18]. S. Karavanskyi in the "Practical dictionary of synonyms of the Ukrainian language" ("Praktychnyi slovnyk synonimiv ukrainskoi movy") (1993) also offers synonyms for the analyzed term *vertolit*, which in this dictionary is part of the terminological phrase vertical take-off airplane - *vertolit, helikopter* – (small size) wasp, fly, flea [9].

Since the middle of the twentieth century, aviation terms have been recorded in specialized dictionaries, in particular, the "Military aviation dictionary" ("Viiskovyi aviatsiinyi slovnyk") (1966) provides the following lexemes: litalnyi aparat (aircraft), aparat hvyntokrylyi litalnyi (helicopter aircraft), aparat bezpilotnyi litalnyi (unmanned aerial vehicles). The terms *vertolit (helikopter), hvyntokryl* are components of the concept of "aircraft", which detail and clarify it: the aircraft - a device for flying in the atmosphere or outer space. Aircraft are: manned and unmanned; single and reusable; research, passenger freight, agricultural, military, sports, etc. An aerostatic aircraft in which the lifting force is formed due to the difference between the density of atmospheric gas and the gas filling the shell (e.g. balloon, airship), an aerodynamic aircraft in which the lifting force is created by a wing (airplane, glider, ekranoplan) or propeller (*vertolit, avtozhyr, hvyntokryl*) [23].

Hvyntokryl (English rotor-winged aircraft - in international terminology common names *hirodyn, heliplan*) is an aerodynamic aircraft that can take off and land vertically, in which the lifting force is created by a combined support system built on one or two propellers and wings. This device belongs to the combined (hybrid aircraft), it is a combination of helicopter and airplane.

It should be noted that the meaning of the analyzed lexemes is distinguished in the "Aviation rules of Ukraine" (ARU). According to the document, the term *vertolit* is "an aircraft heavier than air that is held in flight, mainly due to the interaction of air with one or more propellers, which rotates the engine around axes that are almost in the vertical plane." The term *hvyntokryl* in the same document is defined as: "an aircraft heavier than air, which is moved by an engine and maintained in the air due to the interaction of air with one or more propellers" [1]. It is also interesting that in German the terms *vertolit* (helicopter) and *hvyntokryl* are formed on the basis of their own language and do not have a pronounced synonym, available in the Ukrainian language. For example, the term *hvyntokryl* (Drehflügler) is formed by two bases: dreh- from drehen (rotate) and flüg- from flügel (wing) and the suffix -ler with a sign of objectivity [2], ie literally – *obertokryl* (overhead wing). The main lexeme to denote these lexemes is the term Hubschrauber (вертоліт) [2], in addition to which the terms Helikopter and Heli (truncated form) also function.

As you can see, in the aviation terminology of the Ukrainian language it is quite difficult to distinguish between the terms *vertolit* (implicit differential feature 'lack of wing') and *hvyntokryl*

(differential feature - 'wing') The term *hvyntokryl* is synonymous with a combined *vertolit* (synonymization based on common features 'wing' and 'propeller'). The terms *vertolit* and *hvyntokryl*, in our opinion, are absolute synonyms (synonymization based on the sign ‘propeller’).

Thus, synonymy in terminology is undesirable, but it can't be completely avoided. V.P. Danylenko notes that synonyms cannot be the rule, but the frequency of exceptions creates the preconditions for the emergence and existence of variant forms of one concept. The categorical prohibition contradicts the practice of using these terms in other areas (scientific literature, lexicographic sources). The author emphasizes that it would not be necessary to deny synonymy, as its appearance is felt at the level of syntagmatic when each of the variants of the term is perceived in a particular speech act and at the level of paradigm if we perceive the term system as a whole [7].

Ability to properly form an intercultural communication strategy and to show himself as an active participant in the intercultural communicative process - the basis of professional activities of an aviation specialist. Note that important for further research there are problems that arise in the formation and development of intercultural skills communication of future aviation specialists [15].

The study of abbreviations in the aviation industry deserves special attention. One of the main reasons for the abbreviation is the need for accuracy, speech and graphics savings. A characteristic feature of the terminological abbreviation is that it is most often used as a parallel version of multicomponent terms, which, under compression, form new words without changing the meaning of the original term: aircraft engine - aircraft engine and so on. Intensive use of abbreviations is due primarily to non-contractual factors, including the intensification of Ukraine's international relations in the field of aircraft construction, air traffic management, cooperation between the state and international organizations. Terms-abbreviations in their structural, semantic, phonetic, stylistic, graphic features are ambiguous. They have the features of only secondary (repeated) nomination and are used for language economy, for convenience for multiple use. Aviation terminology is characterized by the use of abbreviated terms in parallel with full terms, especially in professional speech [11].

Against the background of modern global linguistic processes, the problem is the uncontrolled borrowing of new terms. Sometimes it is very difficult to find a kind of "terminological compromise" by which it would be possible to correctly translate, form a term and best adapt it to the norms of the Ukrainian language. In such cases, it is important to keep a balance of own and borrowed terms, because, the oversaturation of domestic terminology leads to a difficult understanding of the semantics of new borrowings, and often makes it impossible to communicate professionally. Of course, the process of borrowing keeps permanent, sometimes uncontrolled, spontaneous, and difficult at the initial stage of borrowing to determine whether the lexeme is indispensable or can be formed from their own resources. That is why linguists use the criterion of the functional potential of language innovations to determine how viable a neonym is “as a total indicator of the volume and nature of its 1) paradigmatic, epidigmatic (derivational) and 2) syntagmatic relations in the language system and in the text, its nominative, and communicative activity” [10]. At present, active work is underway to normalize such terms. In this regard, there are several committees and commissions, including the Committee of Scientific Terminology of the National Academy of Sciences of Ukraine” (Kyiv), “Technical Committee for Standardization of Scientific and Technical Terminology” (TC 19 “Scientific and Technical Terminology”) (Lviv) and others.

6. Conclusions

Thus, the article draws attention to the principles of content richness, professional significance, scientific informativeness, novelty, semantic completeness, problems, accessibility to a specialist in one or more fields. The principle of content saturation is based on the novelty of professionally-oriented information, its cognitive value, lexical and grammatical content. The principle of intertextuality of the term as a special way of constructing the meaning of the text is also important. Summarizing we can note that the presence of basic requirements for the term as a unit of the terminological system is not a categorical requirement for their functioning. As noted above, such

norms are not ultimatums, but rather a desire within a variety of industry terminology. In our opinion, their observance will contribute to its further standardization and elimination of shortcomings: incorrect or opaque motivation or orientation, the presence of extensive synonymy, or lack of accuracy. Solving the current problems of the professional language of aviation will help to overcome the difficulties of professional communication and the active integration of national terminology into global practice.

References

[1] 2012 *Aviatsiini pravyla Ukrainy. Ch. 47. Pravyla reiestratsii tsyvilnykh povitrianykh suden v Ukraini. P. 1.3. Avtozhyr (Nakaz Ministerstva infrastruktury Ukrainy vid 25.10.2012 r.)* http://zakon1.rada.gov.ua/laws/show/z1926-12
[2] Bardyishev G, Baron L, Bryizgalin N 1973 *Nemetsko-russkiy politehnicheskiy slovar* (M.: Russkiy yazyik) p 863
[3] Bulakhovskyi L 1954 *Russkyi literaturnyiy yazyik pervoy polovinyi XIX* (M.:Fonetyka. Morfolohyia. Udarenye. Syntaksys)
[4] Burlakova I, Sibruk A 2018 *Safety in Aviation and Space Technologies* **10-12** 3.1.10
[5] Burlakova I, Sibruk A, Chukhlib T 2018 *Metaphor and metonomy as a means of term derivation. The scientific heritage Hungary* **33(3)** 22
[6] Boikiv I, Iziumov O, Kalyshevskyi T, Trokhymenko M 1996 *Slovnyk chuzhomovnykh sliv* (Muzei I. Honchara, vyd. firma "Rodovid") p 535
[7] Danylenko V 1972 *Termynolohyia y norma. O yazuke termynolohycheskykh standartov* (M.: Nauka) p 120
[8] Dubrovskyi V 1918 *Slovnyk moskovsko-ukrainskyi* (Kyiv, Ridna mova) p 542
[9] Karavanskyi S 1993 *Praktychnyi slovnyk synonimiv ukrainskoi movy* (K.: "Kobza") p 469
[10] Karpilovska, Ye 2006 Materialy IKh *Mizhnarodnoi naukovoi konferentsii «Funktsionalni aspekty slovotvorennia» Komisii zi slovianskoho slovotvorennia pry Mizhnarodnomu komiteti slavistiv* (Minsk) p 92
[11] Khalinovska L 2010 *Visnyk Natsionalnoho universytetu «Lvivska politekhnika»* **675** 50
[12] Kovtun O 2013 *Teoretyko-metodolohichni zasady formuvannia profesiinoho movlennia u maibutnikh fakhivtsiv aviatsiinoi haluzi* (Odesa) p 531
[13] Kyrychenko A 2013 *Visnyk Lvivskoho universytetu. Seriia inozemni movy. Journal* **21** 63
[14] Maksymovych H, Kodola R 2019 *Zb. materialiv I Mizhvuzivskoi naukovo-metodychnoi konferentsii* (Kyiv: VDA) p 129
[15] Plachynda T, Ursol O 2018 *Naukovyi visnyk lotnoi akademii. Seriia : Pedahohichni nauky* **3** 139
[16] Selihei P 2008 *Puryzm u terminolohii: ukrainskyi dosvid na yevropeiskomu tli. Movoznavstvo* **1** 60
[17] Sibruk A, Dobrovol′s′ka L 2019 *Aktual'ni pytannya humanitarnykh nauk: Mizhvuzyvs'kyy zbirnyk naukovykh pratsiv molodykh vid Drohobyts'koho vchytelya movisnoho inversytetu Ivana Franka* **23(3)** 33
[18] Shtepa P 1977 *Slovnyk chuzhosliv. Znadibky* (Toronto: Ivan Hladun i syny) p 452
[19] Karavanskyi S 1993 *Praktychnyi slovnyk synonimiv ukrainskoi movy* (K.:"Kobza") p 469
[20] Skorokhodko E 2008 *Ukrainska mova* **1** 69
[21] Symonenko L 2006 *Biolohichna terminolohiia: Formuvannia ta funktsionuvannia* (Uman: RVTs Sofiia) p 103
[22] Turovska L 2010 *Visnyk Natsionalnoho universytetu "Lvivska politekhnika". Problemy ukrainskoi terminolohii. Vydavnytstvo Lvivskoi politekhniky* **676** 83
[23] Vasylev L 1990 *Sovremennaia lynhvystycheskaia semantyka. Ucheb. posobye dlia vuzov* (M.) p 176
[24] Berezin V P, Vasilkov G S, Gartsev V P 1966 *Voenno-aviatsionnyiy slovar* (M.: Voenizdat) p 472

[25] Yagupov V 2012 *Problems of training specialists* http://www.rusnauka.com/4_SND_2013/Pedagogica/2_127258.doc.htm
[26] Zadoiana L 2008 *Synonimiia v cuchasnii ukrainskii terminolohii tsukrovoho vyrobnytstva* **620** http://vlp.com.ua/files/50_3.pdf
[27] Zhytin Ya 2008 *Terminolohiia* **620** 9 http://ena.lp.edu.ua:8080/bitstream/ntb/2640/1/02.pdf